

CLAIMS

WHAT IS CLAIMED IS:

1. A coupling device (100) for liquid-tight coupling of at least one liquid line (10) to a fluidic system (20), which comprises:

- at least one sealing device (30) having at least one bushing (32), which is adapted to receive an end region (11) of the at least one liquid line (10) and has a first sealing surface (31) for contact on an external surface (22) of the fluidic system, the end of the liquid line (10) being laterally enclosed by the first sealing surface (31) and pointing toward an opening (23) in the external surface (22), and

- a clamping device (40) having at least one hollow plunger (41, 47), which forms a receptacle (43) for at least a part of the bushing (32) and using which the bushing (32) may be pressed onto the fluidic system (20), so that the first sealing surface (31) produces a liquid-tight connection with the external surface (22), characterized in that

- the at least one hollow plunger (41, 47) being situated so it is movable in relation to the external surface (22), and

- the bushing (32) having an external shape which interacts with the internal shape of the hollow plunger (41, 47) of the clamping device (40) in such a way that a force directed toward the external surface (22) of the fluidic system may be exerted on the bushing (32) using the hollow plunger (41, 47).

2. The coupling device according to Claim 1,

wherein the at least one hollow plunger (41, 47) forms a conical or a cylindrical receptacle (43) for the particular bushing (32) of the sealing device (30).

3. The coupling device according to Claim 2,

wherein the at least one bushing (32) of the sealing device (30) has a conical external shape.

4. The coupling device according to one of the foregoing claims, wherein the at least one bushing (32) of the sealing device (30) has a projection (33) which forms the first sealing surface (31) and an engagement surface for the clamping device (40).

5. The coupling device according to one of the preceding claims,

wherein the at least one bushing (32) has an internal hollow channel (34) which is adapted for removably receiving the end region (11) of the liquid line (10), the internal hollow channel (34) forming a second sealing surface (35) and the sealing device (30) being able to be pressed against the end region (11) of the liquid line (10) using the hollow plunger (41, 47) in such a way that the second sealing surface (33) produces a liquid-tight connection with the surface of the end region (11).

6. The coupling device according to Claim 5,

wherein the internal hollow channel (34) has a cylindrical internal shape.

7. The coupling device according to one of the preceding claims,

wherein the first sealing surface (31) is larger than the cross-sectional area of the end of the liquid line (10).

8. The coupling device according to one of the preceding claims,

wherein multiple bushings (32) are provided on the sealing device (30), which form at least one sealing unit (36) and using which multiple liquid lines (10) may be coupled to the fluidic system (20) simultaneously.

9. The coupling device according to Claim 8,

wherein the bushings (32) of the sealing device (30) are connected to one another in rows or in a matrix in the at least one sealing unit (36).

10. The coupling device according to Claim 9,

wherein the at least one sealing unit (36) forms a sealing mat (33), from which the bushings (32) project.

11. The coupling device according to Claim 8 or 9, wherein the clamping device (40) comprises a fluidic block (45), in which hollow plungers (47) are formed in accordance with the arrangement of the bushings (32) of the sealing unit (36).

12. The coupling device according to one of Claims 8 through 11,

wherein a holding plate (25) is provided, which is permanently connected with the fluidic system (20) and which is set up for positioning the at least one sealing unit (36) on the fluidic system (20).

13. The coupling device according to Claim 12, wherein the fluidic block (45) may be pressed onto the holding plate (25) using a bayonet connector (42).

14. A fluidic system (20) having a chip body (24), to which at least one liquid line (10) is connected using a coupling device according to one of the preceding claims.

15. The fluidic system according to Claim 14, wherein the chip body (24) has an external surface (22) which is planar at least in some sections and in which at least one opening (23) is formed, which a line end (11) of the at least one liquid line (10) adjoins.

16. The fluidic system according to Claim 15, wherein the line end (11) of the at least one liquid line (10) has a cylindrical external shape.

17. The fluidic system according to one of Claims 14 to 16, which comprises a fluidic microsystem.

18. A method for liquid-tight coupling of at least one liquid line (10) to a fluidic system (20) using a coupling device (100) according to one of preceding Claims 1 through 13, having the following steps:

- forming a composite of the at least one liquid line (10) with one bushing (32) of a sealing device (30), respectively, the clamping device (40), and the fluidic system (20), and

- actuating the clamping device (40) to produce a contact pressure on the projection (33) of the bushing (32) in such a way that the sealing device (30) forms the liquid-tight connection with the external surface of the fluidic system (20).

19. The method according to Claim 18, wherein, to produce the composite, the end region (11) of the liquid line (10) is plugged into a bushing (32) of the sealing device (30), which was previously positioned with the clamping device (40) on the fluidic system (20), so that the end of the liquid line (10) points toward an opening in the external surface of the fluidic system (20).

20. The method according to Claim 18, wherein, to produce the composite, the end region (11) of the liquid line (10) is plugged into a bushing (32) of the sealing device (30), which is subsequently connected to the clamping device (40) and positioned on the fluidic system (20), so that the end of the liquid line (10) points toward an opening in the external surface of the fluidic system (20).

21. The method according to one of Claim 18 through 20,

wherein the contact pressure is exerted by closing a bayonet connector (42) between the clamping device (40) and the fluidic system (20).